

STANDARD HOOK				
TENSION DEVELOPMENT LENGTHS FOR GRADE 60 REINFORCING BARS (NORMAL WEIGHT CONCRETE)				
BAR SIZE	F _c = 4000 PSI			
	L _{db}	0.7 L _{db}	90° HOOK	180° HOOK
#3	7	6	5	3
#4	9	7	6	3
#5	12	8	8	3
#6	14	10	9	3
#7	17	12	11	4
#8	19	13	12	4
#9	21	15	14	5
#10	24	17	16	6
#11	27	19	17	6

NOTES:

- L_d = TENSION DEVELOPMENT LENGTH
- ALL SPLICE LENGTHS ARE IN INCHES
- L_{db} = L_{db} UNLESS CONDITIONS OF ITEM 4 ARE SATISFIED
- L_{db} = 0.7 L_{db} FOR #1 BARS AND SMALLER WHEN SIDE COVER (NORMAL TO PLANE OF HOOK) IS NOT LESS THAN 2 1/2 INCHES AND FOR #2 HOOKS, COVER ON BAR EXTENSION BEYOND HOOK IS NOT LESS THAN 2 INCHES
- HOOKS ARE NOT CONSIDERED EFFECTIVE FOR DEVELOPING BARS IN COMPRESSION

DEVELOPMENT LENGTHS OF STANDARD HOOKS IN TENSION

NOT TO SCALE

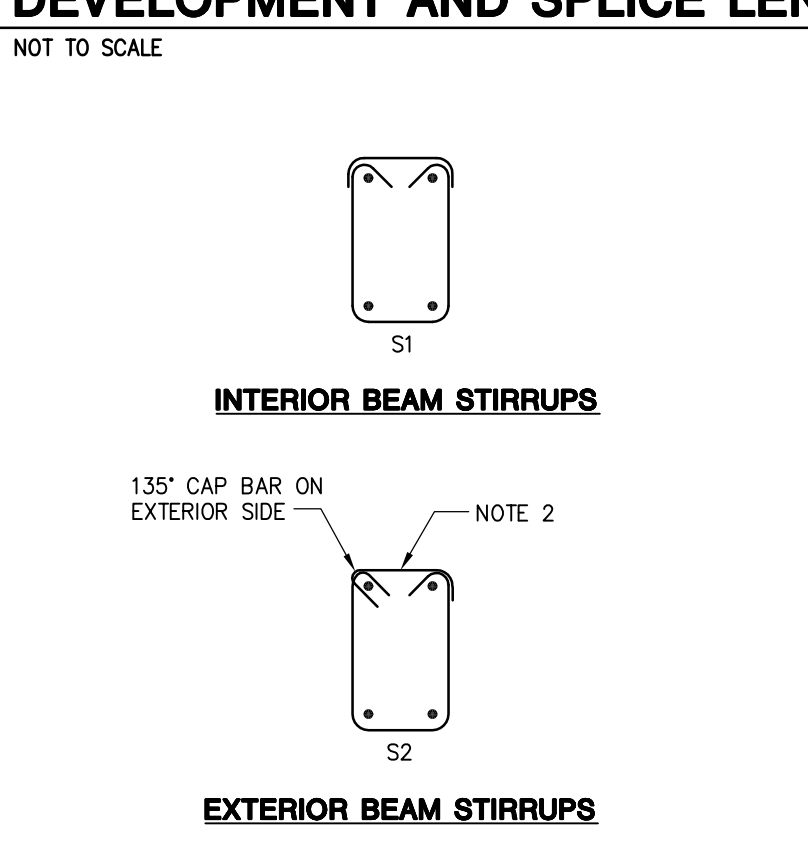
BEAM AND JOIST BAR		
TENSION DEVELOPMENT LENGTHS AND LAP SPLICING LENGTHS FOR GRADE 60 REINFORCING BARS (NORMAL WEIGHT CONCRETE)		
BAR SIZE	F _c = 4000 PSI	
	CLASS B (TOP BAR) (1.3 L _{db})	CLASS B (OTHER BAR) (1.3 L _{db})
#3	25	20
#4	33	25
#5	41	32
#6	49	38
#7	71	55
#8	81	63
#9	91	71
#10	103	80
#11	114	88

NOTES:

- L_d = TENSION DEVELOPMENT LENGTH
- ALL SPLICE LENGTHS ARE IN INCHES
- A TOP BAR IS DEFINED AS HAVING A MINIMUM OF 12" OF FRESH CONCRETE BELOW BAR
- WHEN LAP SPLICING BARS OF DIFFERENT SIZES, THE LAP LENGTH IS DETERMINED BY THE SMALLER BAR, BUT MAY NOT BE LESS THAN THE CLASS "B" SPLICE LENGTH OF THE LARGER BAR
- LAP SPLICING LENGTH SHOWN IN THIS TABLE ARE VALID FOR BEAMS AND JOISTS ONLY AND SHALL NOT BE USED FOR OTHER STRUCTURAL ELEMENTS

BEAM AND JOIST BAR TENSION DEVELOPMENT AND SPLICE LENGTHS

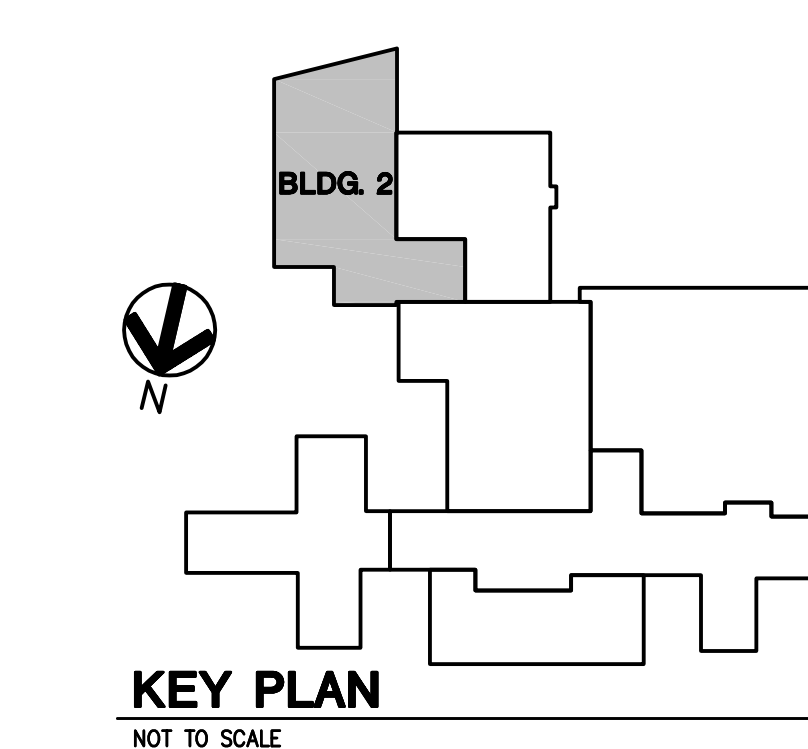
NOT TO SCALE



STIRRUP TYPES

NOT TO SCALE

- NOTES:
- ALL HOOKS TO BE FABRICATED AS REQUIRED BY ACI
 - THE TOP CAP BAR FOR CLOSED STIRRUPS S2 SHALL BE PLACED SUCH THAT THE 135° HOOK END IS ON THE EXTERIOR BEAM SIDE
 - ALL STIRRUPS ARE NO. 4 BAR



NOT TO SCALE

Revisions

Date

SHIVEHATTERY

ARCHITECTURE+ENGINEERING

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Drawing Title

STRUCTURAL BEAM DETAILS

Approved: Division Chief

Approved: Service Director

Project Title

RENOVATE AND EXPAND SPACE FOR PATIENT SUPPORT AREAS

Building Number

2

Checked

MM

Drawn

KLH

Location

IOWA CITY VA HEALTH CARE SYSTEM
IOWA CITY, IOWA

Date

12-05-2014

CONSTRUCTION DOCUMENTS

Project No.

DVA#636-311

S-H#110240-0

DRAWING NO.

2-S8

Dwg. 10 Of 16

Veterans Administration